Academic Program Review

ACADEMIC YEAR	2012-2013	☐ Basic Skills ☒ Transfer ☐ Career Technical Education (CTE)
PROGRAM	Physical Science	
DEPARTMENT	Science, Math, and Engineering	
DIVISION	Health and Sciences	
SUBMITTER	Daniel Gilison	

I. INSTITUTIONAL GOALS

INSTITUTIONAL GOAL **1**	**INSTITUTIONAL MISSION AND EFFECTIVENESS** – The College will maintain programs and services that focus on the mission of the College supported by data-driven assessments to measure student learning and student success.
INSTITUTIONAL GOAL **2**	**STUDENT LEARNING PROGRAMS AND SERVICES** – The College will maintain instructional programs and services which support student success and the attainment of student educational goals.
INSTITUTIONAL GOAL **3**	**RESOURCES** – The College will develop and manage human, technological, physical, and financial resources to effectively support the College mission and the campus learning environment.
INSTITUTIONAL GOAL **4**	**LEADERSHIP AND GOVERNANCE** – The Board of Trustees and the Superintendent/President will establish policies that assure the quality, integrity, and effectiveness of student learning programs and services, and the financial stability of the institution.

II. PROGRAM GOALS

A. PAST – EVALUATION OF PREVIOUS CYCLE OBJECTIVES/PROGRAM GOALS (SET IN PREVIOUS YEAR)

List your previous objectives/goals and associated Institutional Goals. All program goals must address at least one of the institutional goals.

PAST PROGRAM GOALS (Describe past program goals.)	INSTITUTIONAL GOAL(S) (Check all that apply.)

1	PAST PROGRAM GOAL #1	INSTITUTIONAL GOAL(S)
	Identify Program Goal from Last Program Review: Purchase Physics equipment to keep up with current technologies in this field. The goal is to purchase equipment gradually in such a way as not to produce a big impact in the division's budget over the next three years. Accomplishment of this goal will be by comparing inventories.	☐ 1 ☐ 2 ☒ 3 ☐ 4
	☐ Met ☒ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** While some purchases have been made, more equipment is needed, and the need to replace/repair equipment is on the rise as other non-science classes are being taught in the Physics dry labs (students in other classes are touching models/equipment and breaking them).	

2	PAST PROGRAM GOAL #2	INSTITUTIONAL GOAL(S)
	Identify Program Goal from Last Program Review: Education of K-12 students and instructors via hiring of a new chemistry instructor and grant opportunities.	☐ 1 ☒ 2 ☐ 3 ☐ 4
	☐ Met ☐ Partially Met ☒ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** A new chemistry instructor has been recently hired, but no outreach to K-12 has yet been done.	

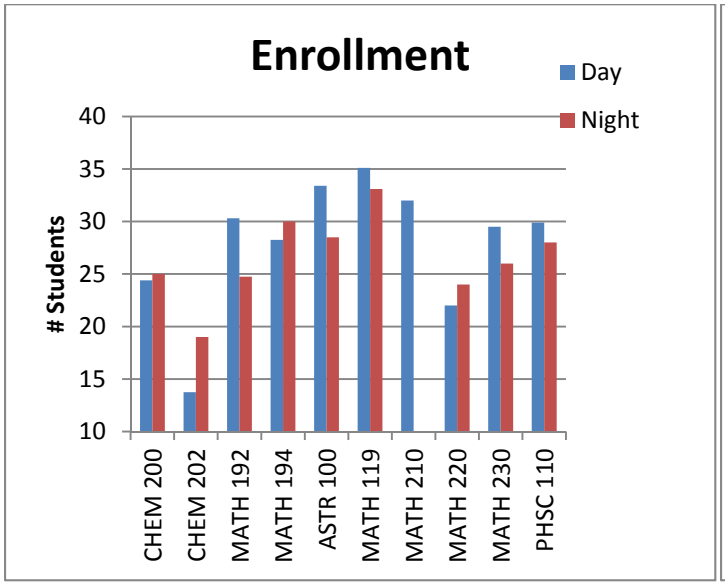
3	PAST PROGRAM GOAL #3	INSTITUTIONAL GOAL(S)
	Identify Program Goal from Last Program Review: The development of a laboratory component to PHSC 110.	☐ 1 ☒ 2 ☐ 3 ☐ 4
	☐ Met ☐ Partially Met ☒ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** Faculty who teach PHSC 110 should continue to discuss this to determine if the course needs a laboratory component, and if so, what is the best way to go about implementing it.	

Comments:

B. PRESENT – DATA ANALYSIS AND PROGRAM HEALTH

1. Summarize and analyze all disaggregated data by day, evening, gender, ethnicity, and distance education regarding enrollments, fill rates, productivity, completion, success, retention, persistence, and transfer (complete a, b, & c). ***Attach graphs or trend data***.

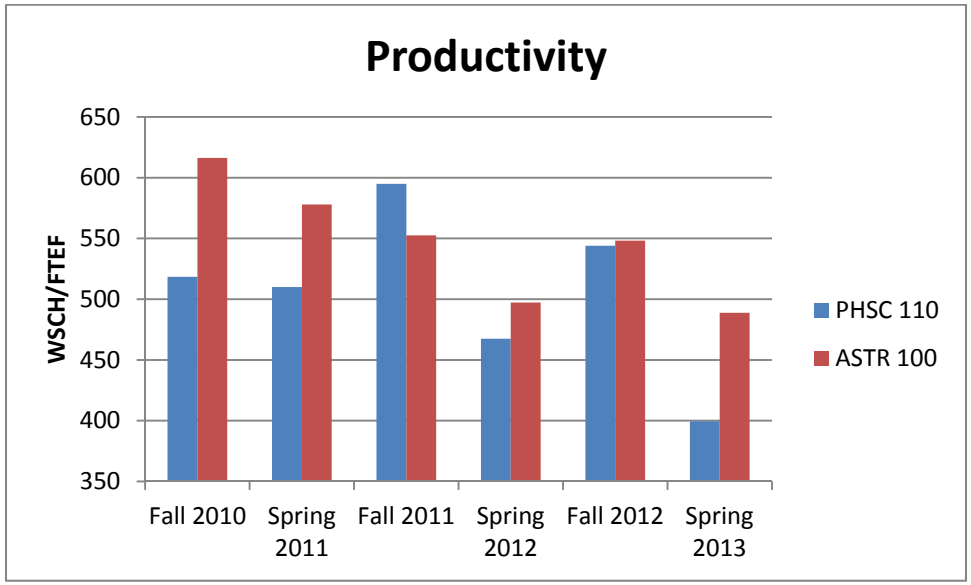
   a. Discuss and chart the trends in enrollment and fill rate for each program by day and evening at the program level.



Most classes in the Physical Science program have high fill rates (80%+). CHEM 202 has had lower fill rates due to the lack of CHEM 100 and CHEM 200 sections, and the loss of a Chemistry part-time faculty member. As I do not have the data for all courses in the Physical Science program, I cannot discuss the program as a whole, just the individual courses where I could examine day vs. night enrollment and fill rates.

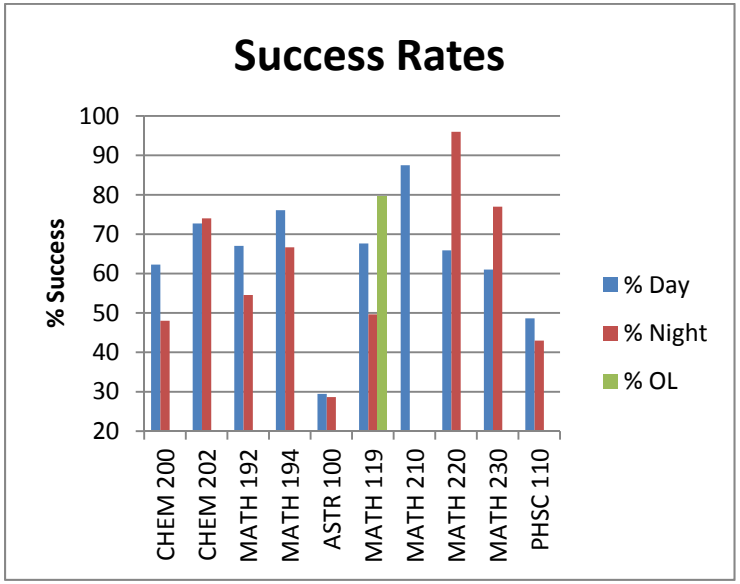
   b. What are the trends in productivity? (WSCH/FTEF) The goal is 525 as per state guidelines. A low number means that we are below target levels for productivity. For example, in a small class that has a mandated cap of 15 students, the fill rate may be 100% but the productivity number (WSCH/FTEF) will be very low. A class with a cap of 40 students with a 100% fill rate will have

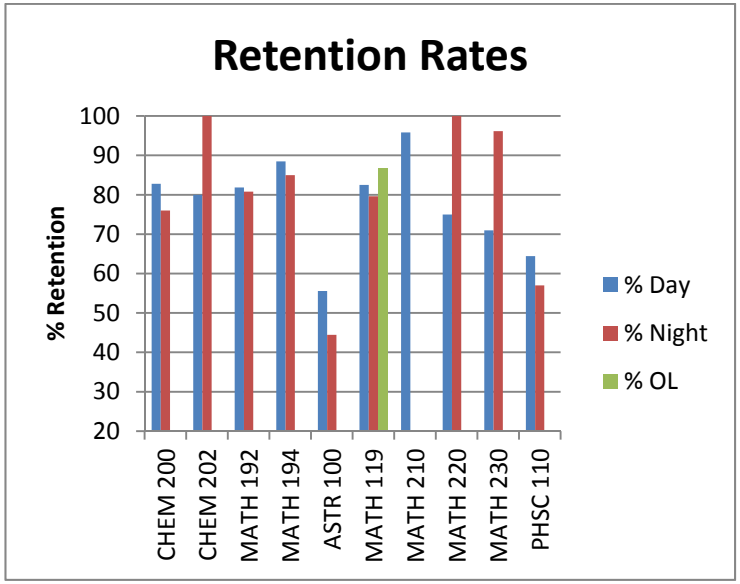
a productivity number close to or above 525.



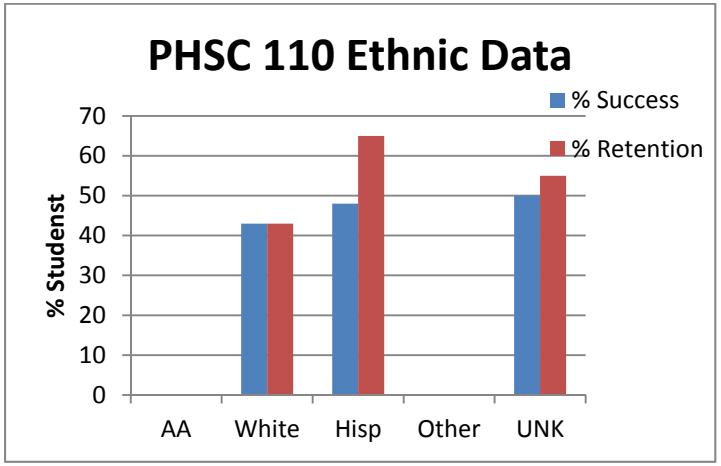
The average WSCH/FTEF for PHSC 110 and ASTR 100 is 506 and 547, respectively. Even though WSCH/FTEF has declined in the Spring 2013 semester, these are both very productive classes.

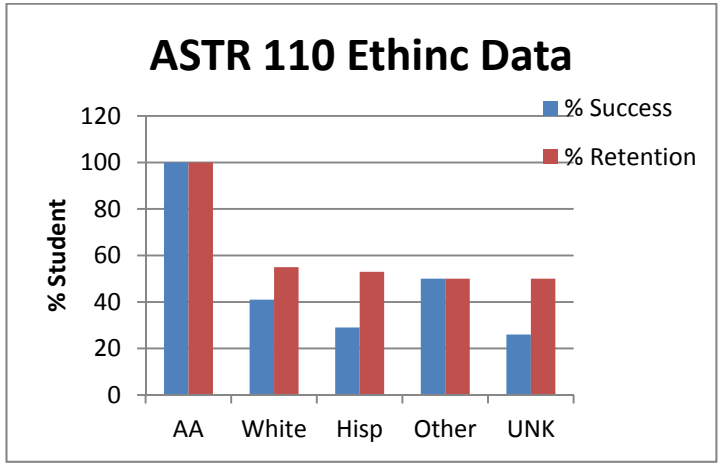
c. Discuss and chart the success and retention rates by day, evening (extended day), and online classes in each program and identify gaps.





d. Discuss and chart the success and retention rates in each program and identify gaps for five ethnic groups. (African-American, White, all Hispanics, Other, Unknown).





For the Physical Science course, PHSC 110, success and retention was fairly similar for all ethnic groups, with retention being higher in the Hispanic group. There was only 1 African-American student who did not remain in the class, and there were no students who fell in the "Other" category.

For the Astronomy course, ASTR 100, success rates ranged from 26-41% in the White, Hispanic, and Unknown groups. There was only one African-American student, and 2 students who were identified as "Other," so the data for those groups is not statistically relevant. Retention rates were relatively equal across the ethnic groups.

e. Discuss the trends in the number of degrees or certificates awarded, if applicable. (You may be able to expand more about this in B.3 below.)

In the past 3 years, 5 students have been awarded degrees in Physical Science. There is no certificate for this major.

f. What program changes, if any, will you recommend that you expect would have a positive effect on your students in your program, if applicable?

One issue is the low success rate of students in the ASTR 100 course. Because this course does not have any prerequisite, and uses basic mathematical skills, we may want to consider adding a mathematics prerequisite to the course. This will ensure that the students are well-prepared for this course, which should help to increase retention and success rates in this course.

2. Summarize revisions, additions, deletions, or alternate delivery methods to courses and/or program based on the last program review.

Some sections of MATH 119 have been offered online, but have not in the past 2 years due to a cutback in the number of online courses being taught. As the DE program becomes more robust, we expect to be able to offer several sections of MATH 119 online in the near future.

3. Evaluate the program's viability by addressing program completion, size (FTES), projections (growing/stable/declining), and quality of outcomes. For CTE programs, also include labor market projections, placement, and performance on external testing/exams (i.e. ASE, NABCEP) and industry-recognized credentials, placement, and performance on external testing or exams (NCLEX, ASC, NAP).

Overall, the program is successful, even though there have only been 5 degrees awarded in the past 3 years. This could be due to many students who are taking these classes are Mathematics majors, or transfer to 4-year universities without applying for their A.A. degree, en route to earning their B.A. or B.S. degrees. FTES in PHSC 110 and ASTR 100 classes have been steady, and in other courses, such as CHEM 200 and CHEM 202, have been increasing.

C. FUTURE – LIST OF "SMART" (SPECIFIC MEASURABLE ATTAINABLE RELEVANT TIME-LIMITED) PROGRAM OBJECTIVES FOR NEXT ACADEMIC YEAR TO ADDRESS PROGRAM IMPROVEMENT, GROWTH, OR UNMET NEEDS/GOALS. ALL PROGRAM GOALS MUST ADDRESS AT LEAST ONE OF THE INSTITUTIONAL GOALS.

FUTURE PROGRAM GOALS (Describe future program goals. List in order of budget priority.)	INSTITUTIONAL GOAL(S) (Check all that apply.)

1	FUTURE PROGRAM GOAL #1 Budget Priority #1	INSTITUTIONAL GOAL(S)
Identify Goal: Increase student transfer opportunities		☐ 1 ☒ 2 ☐ 3 ☐ 4
Objective: Increase number of sections of lower-level chemistry classes (CHEM 100, 200, 202), and offer upper-level chemistry classes (CHEM 204, 206).		
Task(s): Hire another Chemistry instructor to teach additional CHEM 100 and upper-level CHEM sections via a STEM grant proposal.		
Timeline: Expect to hire within 3 years.		

EXPENSE TYPE	FUNDING TYPE		RESOURCE PLAN (Check all that apply.)	BUDGET REQUEST
☐ One-Time ☒ Recurring	☒ Categorical Specify: STEM grant	☐ General Fund	☐ Facilities ☐ Marketing ☐ Technology ☐ Professional Development ☒ Staffing	$80,000

2	FUTURE PROGRAM GOAL #2 Budget Priority #2	INSTITUTIONAL GOAL(S)
Identify Goal: Increase success and retention rates in general science courses.		☐ 1 ☒ 2 ☒ 3 ☐ 4
Objective: Review prerequisites to ASTR 100.		
Task(s): 1) Find out which other schools have math prerequisites for astronomy classes. 2) Make changes in curriculum to ASTR 100 to allow for prerequisites.		
Timeline: This would expected to be completed within 3 years.		

EXPENSE TYPE	FUNDING TYPE		RESOURCE PLAN (Check all that apply.)	BUDGET REQUEST
☐ One-Time ☐ Recurring	☐ Categorical Specify:	☐ General Fund	☐ Facilities ☐ Marketing ☐ Technology ☐ Professional Development ☐ Staffing	$0

3	FUTURE PROGRAM GOAL #3 Budget Priority #3	INSTITUTIONAL GOAL(S)
Identify Goal: Consistency in education among multiple sections of the same course.		☐ 1 ☒ 2 ☐ 3 ☐ 4
Objective: Improved coordination and consistency of the level of instruction for the different sections of PHSC 110 taught by the different instructors.		
Task(s): 1) Instructors should share class schedules, assessments, etc. to examine similarities and differences. 2) Student grade distributions should be examined for different sections to see what differences exist in student success. 3) Faculty work together to have more consistently structured classes.		
Timeline: This would be expected to be completed within 3 years.		

EXPENSE TYPE	FUNDING TYPE		RESOURCE PLAN (Check all that apply.)	BUDGET REQUEST
☐ One-Time ☐ Recurring	☐ Categorical Specify:	☐ General Fund	☐ Facilities ☐ Marketing ☐ Technology ☐ Professional Development ☐ Staffing	$0

TOTAL BUDGET REQUEST	$80,000

1. How will your enhanced budget request improve student success?

Having another Chemistry instructor will allow students to move through the CHEM 200 and CHEM 202 series easier by offering more sections. Also, having more sections of these courses will prevent them from conflicting with other math and physics courses that these students would be taking at the same time.

Comments:

III. INSTITUTIONAL STUDENT LEARNING OUTCOMES (ISLOs)

ISLO 1	COMMUNICATION SKILLS
ISLO 2	CRITICAL THINKING SKILLS
ISLO 3	PERSONAL RESPONSIBILITY
ISLO 4	INFORMATION LITERACY
ISLO 5	GLOBAL AWARENESS

IV. PROGRAM LEARNING OUTCOMES (PLOs)

PROGRAM LEARNING OUTCOMES (Describe learning outcomes.)	**ISLO(S)** [Link PLO to appropriate ISLO(s).]

PLO 1	**PROGRAM LEARNING OUTCOME #1**	**ISLO(S)**
	Identify Program Outcome: Scientific Reasoning Skills: Be able to observe repeatable physical interactions, collect data and apply the scientific method to identify their physical origins.	☐ ISLO 1 ☒ ISLO 2 ☒ ISLO 3 ☐ ISLO 4 ☐ ISLO 5
	Measurable Outcome Summary: In CHEM 202, students were asked 2 lab exam questions on the chemical reaction rates lab. 87% of students answered the first question correctly, and 79% answered the second question correctly.	
	☒ Met ☐ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** Most students understood the concept being tested.	

PLO 2	PROGRAM LEARNING OUTCOME #2	ISLO(S)
	Identify Program Outcome: Quantitative Reasoning Skills: Demonstrate, in a clear and concise manner, how to analyze and solve problems and to evaluate and test the correctness of the proposed solution.	☐ ISLO 1 ☒ ISLO 2 ☐ ISLO 3 ☐ ISLO 4 ☐ ISLO 5
	Measurable Outcome Summary: In CHEM 200, students did a 2-day lab on redox reactions and were asked exam questions based on the lab. Depending on the semester, between 41% and 59% of students answered the questions correctly.	
	☐ Met ☒ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** Chemistry instructors should discuss why students are not performing well on this topic and come up with ways to increase success on this topic.	

PLO 3	PROGRAM LEARNING OUTCOME #3	ISLO(S)
	Identify Program Outcome: Communication and Information Skills: Demonstrate a proficiency in their oral and written communications of their scientific work and ideas in group and/or laboratory exercises.	☒ ISLO 1 ☐ ISLO 2 ☐ ISLO 3 ☒ ISLO 4 ☐ ISLO 5
	Measurable Outcome Summary: In CHEM 200, students keep a lab notebook where they record the purpose, theory, procedure, observations, and data for their labs. They are allowed to use the notebooks during the lab exams, so more carefully writing down their observations and data will result in a higher success rate. On average, 75% of questions were answered correctly on lab exams over 5 semesters of data.	
	☒ Met ☐ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** The high success rate shows that students are demonstrating quality communication skills and information literacy.	

***** ATTACH PLO/SLO GRID *****

Course	# Credits	# SLOs Identified	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013
ASTR100	3	3			1			2
PHSC110	3	3			2			3

Program	# PLOs	Spring 2012	Fall 2012	Spring 2013
Phys Sci	3	1		1,2,3